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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/994,575

11/27/2001

Curtis Hastings

SURR.78

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25871

7590

04/23/2003

SWANSON & BRATSCUN L.L.C.
1745 SHEA CENTER DRIVE
SUITE 330
HIGHLANDS RANCH, CO 80129

EXAMINER

KALIVODA, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/994,575

Applicant(s)

HASTINGS, CURTIS

Examiner

Christopher M. Kalivoda

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Greef, U.S. Patent Application Publication 2002/0053545 in view of Desmartis, European Patent Application Publication EP 0 969 283 A1. Regarding claims 1 - 4,

Greef teaches a method for characterizing a chemical sample, comprising:

a. obtaining a chromatogram from a series of mass spectra of said sample, wherein said mass spectra are generated by chromatography and mass spectrometry (see para 015, lines 1-11),

b. and wherein said chromatogram comprises signal data and noise data (see para 009, lines 1-5) both as indicated in claim 1,

In addition, Greef teaches that the chromatogram is a total ion chromatogram indicated in claim 2 (see para 0015, step 2 - lines 6-10).

Greef also teaches generating individual chromatograms from said total ion chromatogram indicated in claim 3 (see para 0015, steps 3 - 4 - lines 10-11).

However, Greef is silent with respect to applying a median filter to said chromatogram to remove at least some of said noise data, thereby producing a filtered chromatogram.

Desmartis teaches the application of median filters to chromatograms to remove noise data (see para 0013, lines 6-8 and para 0042, lines 11-13).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Greef to include a median filter.

The motivation for such a modification is that the use of such filters enhances edge detection and noise removal and that such filters are easily adjustable to data dimensions: 1 dimensional signals or images or higher dimensional signals can be treated equally well (i.e. the 2 dimensional data of LC/MS) (see column 3, lines 6-16).

Regarding claims 5 and 6, Greef in view of Desmartis teaches the limitations of claim 1 as described above. Furthermore, Desmartis teaches the use of a modified median filter (see column 3, lines 12-16 and para 0042, lines 11-13). Since the median filter can be substituted for the morphological filter, it too can be modified.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use a modified median filter with the invention of Greef.

The motivation for using a modified median filter is that it can be customized to treat a wide range of problems (see column 3, lines 12-16).

Regarding claims 7 and 8, Greef in view of Desmartis teaches the limitations of claim 6 as described above. It would have been obvious to one skilled in the art at the time the invention was made to select various parameters of the median filter including parameters based on subsequent data analysis.

The motivation for selecting different parameters is that the median filter can be customized to treat a wide range of problems (see Desmartis, column 3, lines 12-16).

Regarding claim 9, Greef in view of Desmartis teaches the limitations of claim 8 as described and subsequent data analysis comprises peak selection (see Desmartis column 2, lines 9-11).

Regarding claim 10, Greef in view of Desmartis teaches the limitations of claim 1 as described above to perform a component detection analysis on the filtered ion chromatogram (see Greef, para 0015, lines 1-4).

Regarding claim 11, Greef in view of Desmartis teaches the limitations of claim 1 as described above and the chromatography method used is liquid chromatography (see Greef, para 0028, lines 4-6).

Regarding claims 12 - 15, Greef implies a program storage device accessible by a processor, employing a program of instructions to perform a method for a chemical sample analysis, comprising:

- a. obtaining a chromatogram from a series of mass spectra of said sample, wherein said mass spectra are generated by chromatography and mass spectrometry (see para 015, lines 1-11),
- b. and wherein said chromatogram comprises signal data and noise data (see para 009, lines 1-5) both as indicated in claim 12,

In addition, Greef teaches that the chromatogram is a total ion chromatogram indicated in claim 13 (see para 0015, step 2 - lines 6-10).

Greef also teaches generating individual chromatograms from said total ion chromatogram indicated in claim 14 (see para 0015, steps 3 - 4 - lines 10-11).

However, Greef is silent with respect to applying a median filter to said chromatogram to remove at least some of said noise data, thereby producing a filtered chromatogram.

Desmartis teaches the application of median filters to chromatograms to remove noise data (see para 0013, lines 6-8 and para 0042, lines 11-13).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Greef to include a median filter.

The motivation for such a modification is that the use of such filters enhances edge detection and noise removal and that such filters are easily adjustable to data dimensions: 1 dimensional signals or images or higher dimensional signals can be treated equally well (i.e. the 2 dimensional data of LC/MS) (see column 3, lines 6-16).

Regarding claims 16 and 17, Greef in view of Desmartis teaches the limitations of claim 12 as described above. Furthermore, Desmartis teaches the use of a modified median filter (see column 3, lines 12-16 and para 0042, lines 11-13). Since the median filter can be substituted for the morphological filter, it too can be modified.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to use a modified median filter with the invention of Greef.

The motivation for using a modified median filter is that it can be customized to treat a wide range of problems (see column 3, lines 12-16).

Regarding claims 18 and 19, Greef in view of Desmartis teaches the limitations of claim 17 as described above. It would have been obvious to one skilled in the art at

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the time the invention was made to select various parameters of the median filter including parameters based on subsequent data analysis.

The motivation for selecting different parameters is that the median filter can be customized to treat a wide range of problems (see Desmartis, column 3, lines 12-16).

Regarding claim 20, Greef in view of Desmartis teaches the limitations of claim 19 as described and subsequent data analysis comprises peak selection (see Desmartis column 2, lines 9-11).

Regarding claim 21, Greef in view of Desmartis teaches the limitations of claim 12 as described above to perform a component detection analysis on the filtered ion chromatogram (see Greef, para 0015, lines 1-4).

Regarding claim 22, Greef in view of Desmartis teaches the limitations of claim 12 as described above and the chromatography method used is liquid chromatography (see Greef, para 0028, lines 4-6).

Conclusion


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 5,412,208 to Covey, et al. describes the use of liquid chromatography with mass spectrometry (LC-MS). However, there is no discussion on the use of median filters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Kalivoda whose telephone number is (703)-305-7443. The examiner can normally be reached on Monday - Friday (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (703)-308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-872-9318 for regular communications and (703)-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.

cmk
April 17, 2003


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800